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HOSPITAL EMERGENCY ROOM UTILIZATION BY NORTH CAROLINA MEDICAID ELIGIBLES

by
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Introduction

In 1980 and 1981 data were collected by the State Health Planning Agency in North Carolina concerning emergency room utilization by Medicaid eligible patients. The purpose of this data collection was to identify geographic areas where emergency room use was relatively high. The hypothesis was that some of this high use could be due to visits that could be prevented if adequate primary care services for Medicaid patients were available in the area. "In addition to its traditional role of managing critically ill patients the emergency department has progressively become a backup or substitute for other ambulatory care facilities by treating patients with uncomplicated medical problems (1)." Also, the Division of Medical Assistance was interested in identifying areas where a large number of Medicaid dollars are going for emergency room services.

This study presents a brief descriptive summary of these data and tests the hypothesis that high emergency room use is correlated with a low rate of use of primary care services. We have found that the correlation between county emergency room use and the use of primary care services by Medicaid eligibles is low. Also, there does not appear to be any significant difference between the high utilization counties and the state average with regard to the distribution of emergency room visits by diagnosis. There is, however, a significant positive correlation between the supply of emergency room services in a county and the utilization.

Data Collection

For the fiscal years July 1, 1979 - June 30, 1980 and July 1, 1980 - June 30, 1981 the State Health Planning Agency contracted with the Information Systems Section of the Department of Human Resources to produce data pertaining to hospital emergency room utilization by Medicaid eligibles. The appropriate clearances were obtained from the Division of Medical Assistance. Medicaid paid claims data files were searched for emergency room visits, and some 150,000 claims

*See acknowledgments at end of paper.

of this type were selected for each fiscal year. These claims were then matched back to the master Medicaid eligibles file in order to extract the zip code of the patient's residence. Number of claims and number of Medicaid eligibles were then tabulated for each fiscal year by zip code of residence. Claims for North Carolina residents going to out-of-state hospitals are included, and so we can get a complete picture of North Carolina residents' utilization experience. The number of Medicaid eligibles as of January 1 of each fiscal year was used as a denominator for computing utilization rates. In fiscal year 1981 only, the data were tabulated by county of residence as well as by zip code.

For both years the data were distributed to the Health Systems Agencies and to the Division of Medical Assistance as an aid to identifying high-utilization areas. To aid this identification process, computer-drawn maps of utilization rates by zip code for the 1980 data were produced.

The present study goes beyond this descriptive use of the information and examines correlates of the 1981 county-level emergency room use rates.

Analysis

The original hypothesis behind collecting these data was that high emergency room use could be related to a lack of primary care physicians in an area that serve Medicaid patients, and that high-use areas would therefore be candidates for placement of additional primary care resources. To quantify this relationship, fiscal year 1980-81 data from the Division of Medical Assistance were assembled on claims paid for physician primary care services (office visits). Number of Medicaid recipients and number of claims paid to physicians with specialties of general and family practice, pediatrics, internal medicine, and obstetrics-gynecology were coded and keypunched for each county. These data are available by county of practice of the physicians. The number of Medicaid claims for primary care services provided in local health departments was added from a file of the Division of Health Services. But it was found that only 694 out of 837,000 North Carolina Medicaid claims for primary care services occurred in the local health departments.

Before looking at the relationships between variables, a brief description of emergency room utilization by Medicaid eligibles will be presented. In fiscal year 1979-80 in North Carolina there were 46.4 emergency room visits per 100 Medicaid eligibles, and in 1980-81 this rate was 46.7, showing essentially no change in the state average rate. This compares to an estimated 28.4 emergency department visits per 100 persons in the United States in 1980 (Medicaid plus all others) (1). There is, however, tremendous variation in this utilization rate among North Carolina counties and among zip code areas. Among 100 counties the standard deviation of the rate is about 35 percent of the mean rate, and the highest rates are nearly ten times the size of the lowest. Among approximately 900 zip codes the standard deviation is slightly larger than the mean rate. Table 1 lists the ten zip codes with the highest rates in 1980 and 1981, and Table 2 lists the ten counties with the highest rates in 1981. Rates with less than 20 Medicaid eligibles in the denominator were excluded from Table 1, since 1 eligible with 3 visits, for example, would produce a rate of 300. In Table 1, two of the zip codes show up in the top ten in both 1980 and 1981. Surry, Gaston, and

Table 1
Zip Codes with the Highest Number of
Medicaid Emergency Room Visits Per 100
Eligibles, 1979-80 and 1980-81 (Based on Zip Code of Residence)

<u>1979-80</u>				<u>1980-81</u>			
<u>Zip Code</u>	<u>City/County</u>	<u># Visits</u>	<u>Rate</u>	<u>Zip Code</u>	<u>City/County</u>	<u># Visits</u>	<u>Rate</u>
28089	Lattimore/Cleveland	45	145	27374	Welcome/Davidson	73	203
28738	Hazelwood/Haywood	173	127	27350	Sophia/Randolph	51	155
28745	Lake Junaluska/Haywood	33	127	28669	Roaring River/Wilkes	110	149
27049	Toast/Surry	27	117	27049	Toast/Surry	34	148
28039	East Spencer/Rowan	184	115	28624	Ferguson/Wilkes	54	138
27374	Welcome/Davidson	27	114	28007	Ansonville/Anson	51	124
28077	High Shoals/Gaston	33	114	27208	Bennett/Chatham	24	120
28017	Boiling Springs/Cleveland	84	111	28033	Crouse/Lincoln	60	118
28076	Henrietta/Rutherford	120	110	28034	Dallas/Gaston	460	114
28387	Southern Pines/Moore	663	108	28726	East Flat Rock/Henderson	131	110

Note: Only Zip codes with at least 20 Medicaid eligibles are included here.

Table 2
Counties with the Highest Number of
Medicaid Emergency Room Visits per 100
Eligibles, 1980-81 (Based on County of Residence)

<u>County</u>	<u># Visits</u>	<u>Rate</u>
Cleveland	4754	85.4
Surry	1824	83.3
Gaston	5715	75.9
New Hanover	5063	74.5
Ashe	780	66.1
Pender	1194	66.0
Lenoir	3092	65.6
Mecklenburg	14939	64.7
Davidson	2407	63.6
Transylvania	529	63.5

Davidson county zip codes are represented in both years and these are among the top ten counties in Table 2.

It is primarily the zip code areas with a relatively small number of Medicaid eligibles that have the highest rates, and this may be somewhat misleading as to where the heaviest utilization is since the numbers of visits are relatively small. For some purposes the absolute number of visits is a more meaningful measure since it better reflects the volume of services. Zip codes whose Medicaid-eligible residents experienced greater than 1,500 emergency room visits during the 1980-81 year are shown in Table 3. Of these 16 zip codes only 3 had utilization rates below the state average of 46. Many of these zip codes are located in the high-rate counties in Table 2. Mount Airy in Surry County had a rate of 100 visits per 100 eligibles in 1980-81, but its 1,268 visits was lower than the cutoff point of 1,500. Shelby in Cleveland County had the highest rate of all the zip code areas in Table 3 with 101 visits per 100 eligibles, and in 1979-80 its rate was also high at 98.

To test the hypothesis that high Medicaid emergency room utilization is correlated with a low rate of use of physician primary care services by Medicaid eligibles, Pearson correlation coefficients were computed for the 1980-81 county-specific data between (a) the number of emergency room visits per 100 eligibles and the number of physician primary care recipients per 100 eligibles and (b) the number of visits per 100 eligibles and the number of physician primary care claims per 100 eligibles. Both correlations were very low at +0.17 and +0.11, respectively, and not in the expected direction. We would in fact expect a negative correlation if high emergency room utilization were associated with a low rate of use of primary care services, since high utilization counties would tend to have low primary care use and counties with low utilization would have high primary care use. (The Pearson measure of association varies from +1.0 for a perfect positive relationship to -1.0 for a perfect inverse or negative relationship). We also found very low, though negative, correlations when the same coefficients were based only on the 83 counties with hospital emergency room departments. Thus this hypothesis does not appear to be supported from these data.

As a next step, to see if the high utilization counties had any peculiar characteristics, the distribution of emergency room visits by listed diagnosis was compared to the state average. For North Carolina as a whole, the following diagnoses (with percent) account for about 75 percent of emergency room visits: injury and poisoning (24.9), various symptoms as in ICD-9-CM codes 780-789 (18.8), acute respiratory infections (9.4), infective and parasitic diseases (6.1), diseases of the musculoskeletal system (4.5), otitis media (3.9), mental disorders (2.7), and noninfectious enteritis and colitis (2.5). It might be expected that in counties where high emergency room use was due to non-emergency, primary care type conditions, there would be a lower percent of visits due to injury and poisoning than for the state as a whole. Examination of the distribution of diagnoses for the ten counties in Table 2 did not bear this out. In fact, there was no consistent difference between these ten counties and the state average for any of the major diagnostic categories. In the United States in 1980, by comparison, the percent of emergency department visits due to injuries, burns, and poisonings was 41.1 (for Medicaid plus all others) (1) versus 24.9 percent for North Carolina Medicaid visits. This comparison may, however, be confounded by the large number of "symptoms" reported in the North Carolina Medicaid data.

Table 3
 Zip Codes with the Highest Number of
 Emergency Room Visits in 1980-81
 (Based on Zip Code of Residence)

<u>Zip Code</u>	<u>City/County</u>	<u># Visits</u>	<u>Visits/Eligibles</u> <u>x 100</u>
27105	Winston-Salem/Forsyth	3982	57
28208	Charlotte/Mecklenburg	3937	70
28052	Gastonia/Gaston	3523	78
28150	Shelby/Cleveland	3288	101
28301	Fayetteville/Cumberland	3214	43
28401	Wilmington/New Hanover	3035	72
28501	Kinston/Lenoir	2691	65
28358	Lumberton/Robeson	2596	62
27260	High Point/Guilford	2298	46
27801	Rocky Mount/Nash, Edgecombe	2118	44
28206	Charlotte/Mecklenburg	2111	71
27107	Winston-Salem/Forsyth	1926	65
28205	Charlotte/Mecklenburg	1919	71
27406	Greensboro/Guilford	1833	48
27701	Durham/Durham	1729	52
27834	Greenville/Pitt	1543	37

Finally, we examined the relationship between the supply of emergency room services in a county and the utilization rate of the county's residents. Data on the number of emergency departments and total emergency visits by county of occurrence were obtained from the Emergency Medical Services Section of the Division of Facility Services. The correlation between the number of emergency departments in a county and the visits per 100 eligibles (rate) was +0.49, and the correlation between the total emergency room visits in a county (an indicator of capacity) and the rate was +0.45. Thus about 24 percent (.49 squared) of the variation in emergency room utilization rates across 100 counties can be explained by the number of emergency departments located in the county. It therefore appears that supply is generating demand to some extent for emergency room utilization. Whether this means that emergency rooms are being overutilized in some counties or that there are not enough of these services to meet the need in other counties cannot be answered by the data used in this study.

Summary

This paper has presented a brief description of where in North Carolina emergency room utilization is the highest among Medicaid eligibles, considering zip code and county of residence. No significant relationship was found between county use rates and either the intensity of primary care use in the county or the distribution of emergency room visits by diagnosis. A substantial positive correlation was found between the supply of emergency room services in a county and use of the emergency room by county residents. But around three-quarters of the nearly tenfold variation among North Carolina counties in emergency room use rates is due to factors not measured in the present study.

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State Center for Health Statistics phone number is (919) 733-4728.

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